

Comprehensive Nutritional Profiling and Therapeutic Evaluation of Ten Ayurveda-Based Anti-Rheumatic Dietary Preparations

Swasthik¹, Sandeep Subash Sagare^{1,*}, Suketha Kumari²

¹Department of Swasthavritta & Yoga, Shri B M K Ayurveda Mahavidyalaya, A Constituent Unit of KLE Academy of Higher Education & Research, Belagavi, Karnataka, INDIA.

²Department of Kayachikitsa, Shri B M K Ayurveda Mahavidyalaya, A Constituent Unit of KLE Academy of Higher Education & Research, Belagavi, Karnataka, INDIA.

ABSTRACT

Background: Rheumatic conditions are present in millions of people all over the world, and more attention is directed towards Ayurvedic dietary therapies that should be used as a supplement to conventional treatment methods. The paper provides a nutritional profiling and therapeutic analysis of ten Ayurveda-based anti-rheumatic dietary preparations of traditional Ayurveda. **Objectives:** To identify the nutritional profiling and therapeutic evaluation of ten ayurveda based anti-rheumatic dietary preparations. **Materials and Methods:** Ten Ayurvedic dietary preparations was prepared as per the standard classical procedure were evaluated in terms of macro/micronutrient, bioactive compounds, and anti-inflammatory. Proximate analysis, mineral profiling, antioxidant capacity was done in accordance to the standard procedures. **Results:** The food preparations were highly varied in terms of nutritional profiles, ranging 3.8 to 24.6% protein, 89.2 to 423.7 mg of GAE/100 g total phenolic compounds and 18.7 to 82.4% antioxidant activity (DPPH). Six formulations exhibited significant anti-inflammatory potential with an IC₅₀ measured less than 50.3 g/mL. **Conclusion:** These results offer scientific confirmation of conventional Ayurvedic anti-rheumatic food preparations, as well as their consideration in the protocol of the treatment, but the necessity of standardisation and clinical validation.

Keywords: Anti-inflammatory, Anti-rheumatic, Ayurveda, Dietary preparations, Nutritional profiling, Traditional medicine.

Correspondence:

Dr. Sandeep Subash Sagare

Professor and Head of the Department, Department of Swasthavritta & Yoga, Shri B M K Ayurveda Mahavidyalaya, A Constituent Unit of KLE Academy of Higher Education & Research, Belagavi, Karnataka, INDIA.

Email: sandeepsagare@gmail.com

Received: 22-12-2025;

Revised: 13-02-2026;

Accepted: 08-04-2026.

INTRODUCTION

Rheumatic diseases refer to a broad category of inflammatory diseases or disorders that involve joints, bones, muscles, and connective tissues, and which also afflict about 350 million individuals across the globe (Safiri *et al.*, 2019). The burden of rheumatic diseases in the world steadily increases, and the most common are osteoarthritis and rheumatoid arthritis (Patwardhan *et al.*, 2017). Although the conventional pharmaceutical interventions are still considered the main treatment option, the therapeutic value of the traditional medicine systems and, in particular, Ayurveda, in the management of inflammatory conditions is gradually being acknowledged (Sharma *et al.*, 2019).

The Ayurveda, the ancient Indian model of medicine, has a concept of food as medicine (*Ahara* as *Aushadha*) and acknowledges the possibility of particular preparations of food being useful in the treatment of the disease (Singh *et al.*, 2021). Based on Ayurvedic, rheumatic disorders are mainly related to the vitiation of the Vata dosha, the accumulation of *Ama* (metabolic toxins), and dietary interventions having an anti-inflammatory effect, analgesic properties, and immunomodulatory effects are required (Aggarwal & Harikumar, 2009).

The Ayurvedic literature contains many dietary preparations that are directly aimed at the treatment of rheumatic diseases, and they use ingredients with proven anti-inflammatory effects like ginger (*Zingiber officinale*), garlic (*Allium sativum*), turmeric preparations and also various therapeutic grains and vegetables (AOAC, 2016). These nutritional preparations are not just nutritional supplements, but are rather a holistic method of treating inflammatory disease using a carefully chosen combination of ingredients that have a synergistic effect on treating the disease.



DOI: 10.5530/pres.20260265

Copyright Information :

Copyright Author (s) 2026 Distributed under Creative Commons CC-BY 4.0

Publishing Partner : Manuscript Technomedia, [www.mstechnomedia.com]

Although these dietary preparations have been used widely traditionally, there is paucity of scientific assessment on such dietary preparations, which presents a huge gap between traditional knowledge and scientific validation. The current research will help fill this gap by a systematic nutritional profiling and therapeutic analysis of 10 classical Ayurveda-based anti-rheumatic dietary preparations usually prescribed in the traditional practice.

MATERIALS AND METHODS

Selection of Dietary Preparations

Ten classical Ayurvedic anti-rheumatic dietary formulations were chosen according to the classical textual reference of the *Yoga Ratnakar*, *Bhaisajya ratnavali* and *Vangasena* as well as the modern Ayurvedic practice principles. The formulations chosen were:

- *Shunti Sidda Ushna Jala* (Ginger-infused water).
- *Shyamaka Upma* (Barnyard millet upma).
- *Lashuna Sidda Takra* (Buttermilk processed with garlic).
- *Rakta Shali Anna* (Red rice preparation).
- *Yava Roti* (Barley flatbread).
- *Kulatta Yusha* (Horsegram soup).
- *Karavellaka Sabji* (Bitter gourd stir-fry).
- *Panchakola Sidda Ushna Jala* (Five-spice medicated water).
- *Chanaka Yusha* (Black chickpea soup).
- *Shigru Sabji* (Drumstick vegetable stir-fry).

Sample Preparation

All the raw materials are purchased by the verified suppliers and confirmed by botanists in the KLE Ayurveda Pharmacy, Belagavi. The dietary preparations were developed using the classical techniques that were elaborated in the Ayurvedic literature under controlled laboratory conditions by adhering to classical cooking practices. To preserve nutritional and bioactive components, fresh preparations were freeze-dried, powdered (where necessary), and stored in airtight containers at -20°C until analyzed.

Nutritional Analysis

Proximate Composition

The determination of moisture, ash, crude protein, crude fat and crude fiber was done according to the AOAC methods (Singh *et al.*, 2018). Total carbohydrate content was calculated by difference method. Energy value was calculated using Atwater factors (Singleton *et al.*, 1999).

Mineral Analysis

Atomic Absorption Spectrophotometry (AAS) was used to analyse the macro and microelements (Ca, Fe, Zn, Mg, K, Na, Cu, Mn) according to the standard procedure after wet digestion with nitric acid-perchloric acid mixture (Chang *et al.*, 2002).

Bioactive Compound Analysis

Total Phenolic Content

Determined using Folin-Ciocalteu reagent method with gallic acid as standard, expressed as mg Gallic Acid Equivalents (GAE) per 100 g sample (Brand-Williams *et al.*, 1995).

Total Flavonoid Content

Analysed using aluminium chloride colorimetric method with quercetin as standard, expressed as mg Quercetin Equivalents (QE) per 100 g sample (Re *et al.*, 1999).

Antioxidant Activity Assessment

DPPH Radical Scavenging Activity

Evaluated using 2,2-diphenyl-1-picrylhydrazyl (DPPH) method with ascorbic acid as positive control (Chandra *et al.*, 2012).

ABTS Radical Scavenging Activity

Assessed using 2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) method with Trolox as standard (Stamm *et al.*, 2017).

Anti-inflammatory Activity

In vitro anti-inflammatory activity was evaluated using protein denaturation inhibition assay and membrane stabilization assay following established protocols with diclofenac sodium as positive control (Kieffer *et al.*, 2016).

Statistical Analysis

Each experiment was done in triplet. The analysis of data was performed with the help of SPSS 26.0. Multiple comparisons were made using one-way ANOVA and then using Tukey *post hoc* test. Pearson correlation analysis was done to create connections between variables. The results are shown as mean standard deviation and $p < 0.05$ taken to be significant.

Ethical Statement

This study did not involve human participants or experimental animals. All analyses were conducted on Ayurvedic dietary preparations using *in vitro* methods; therefore, ethical approval was not required.

RESULTS

Proximate Composition

The immediate structure of the ten Ayurvedic anti-rheumatic dietary preparations was significantly different based on their

different ingredient constituents (Table 1). The protein content of *Shunti Sidda Ushna Jala* was between 3.8 and 24.6% in *Kulatta Yusha*. *Yava Roti* contained the highest amount of carbohydrates (72.8%) and *Karavellaka Sabji* contained the lowest amount of carbohydrates (8.4%). These values of energy were 89 kcal/100 g in *Shunti Sidda Ushna Jala* and 367 kcal/100 g in *Yava Roti*.

Mineral Content

Analysis through minerals showed that there were high fluctuations in preparations based on their ingredients (Table 2). *Kulatta Yusha* was found to have the highest calcium content (387 mg/100 g) and *Shigru Sabji* have the highest iron content (18.9 mg/100 g). The concentrations of potassium in the vegetable preparations were also very high with ranges of 245 to 1987 mg/100 g.

Bioactive Compounds

The contents of total phenolic contents differed greatly among preparations with the highest amount belonging to *Panchakola Sidda Ushna Jala* (423.7 mg GAE/100 g) followed by *Karavellaka Sabji* (387.4 mg GAE/100 g). The minimum phenolic content was at *Shyamaka Upma* (89.2 mg GAE/100 g). The total flavonoid content was 23.4-178.9 mg of QE/100 g.

Antioxidant Activity

The DPPH radical scavenging activity was significantly different among the preparations with each of *Panchakola Sidda Ushna Jala* (82.4%), *Karavellaka Sabji* (78.6%) showing the highest activity. Animal was found to be the least active (18.7) *Shyamaka Upma*. The same was observed with the ABTS radical scavenging activity, and phenolic content was strongly correlated.

Anti-inflammatory Activity

In the protein denaturation inhibition assay, six preparations showed a high level of anti-inflammatory activity as shown by IC_{50} of less than 50 g/mL (Table 3). *Panchakola Sidda Ushna Jala* showed the most potent anti-inflammatory activity ($IC_{50} = 21.7 \mu\text{g/mL}$), followed by *Karavellaka Sabji* ($IC_{50} = 28.4 \mu\text{g/mL}$) and *Shunti Sidda Ushna Jala* ($IC_{50} = 34.6 \mu\text{g/mL}$).

Correlation Analysis

The phenolic content and antioxidant activity ($r = 0.914, p < 0.001$) and the anti-inflammatory potential and antioxidant activity ($r = 0.867, p < 0.001$) were found to be strongly correlated. The mechanistic relationship of bioactive compounds with therapeutic activities (Figure 1) is supported by these correlations.

DISCUSSION

Investigation of the detailed nutritional characterizations of ten Ayurvedic anti-rheumatic nutritional preparations showed a substantial difference in the macro and micronutrient composition, bioactive compounds, and therapeutic possibilities.

This scientific evidence suggests that these formulations can be used effectively in the management of rheumatic disorders and the various therapeutic actions the formulations have may be identified.

Nutritional Significance

Protein levels between these preparations were quite different (0.6-6.7%), pulse-based preparations such as *Kulatta Yusha* and *Chanaka Yusha* had larger values. Although this protein content is not fixed, it helps tissue repair, as well as immunological function improvement, which comes in handy, especially to patients with chronic inflammatory diseases (Weiss & Goodnough, 2005).

The compositions of carbohydrates are indicative of ingredient composition, in which grain-based preparations (*Rakta Shali Anna*, *Yava Roti*) offer a sustained flow of energy. *Yava Roti* (12.0) and *Shyamaka Upma* (9.8) are high in fiber (also good in) that helps the digestive system and can aid in anti-inflammatory properties by modifying the gut microbiome (Srinivasan, 2007).

The mineral test reflected high therapeutic value especially the calcium level in *Kulatta Yusha* (387 mg/100 g) and *Shigru Sabji* (321 mg/100 g), which is important in the maintenance of bone health in rheumatic patients. The high level of iron in *Shigru Sabji* (18.9 mg/100 g) will treat the iron deficiency that is prevalent in chronic inflammatory diseases.

Bioactive Compounds and Antioxidant Activity

This large range of total phenolic and flavonoid content between preparations is a result of the difference in their phytochemical profiles. The five-spice formulation of *Panchakola Sidda Ushna Jala*, which provides the compound with an outstanding phenolic content (423.7 mg GAE/100 g), is a product of the concentrated formulation of long pepper, black pepper, dried ginger, *Plumbago zeylanica* (*Chitraka*), which have been known to possess anti-inflammatory properties.

The production of high phenolic scope (387.4 mg GAE/100 g) of *Karavellaka Sabji* is associated with high levels of phenolic acids, flavonoids, and cucurbitane-type triterpenoids in bitter gourd, which has anti-inflammatory and antioxidant properties. Phenolic compounds are the main contributors of antioxidant capacity, which is proven by the high correlation between phenolic content and antioxidant activity ($r = 0.914$).

Anti-inflammatory Potential and Therapeutic Mechanisms

The high quality of the anti-inflammatory properties exhibited by *Panchakola Sidda Ushna Jala*, *Karavellaka Sabji*, and *Shunti Sidda Ushna Jala* give scientific support to the use of the herbs in rheumatic diseases (Jia et al., 2017). The second test is protein denaturation inhibition assay, which is especially applicable because protein denaturation is one of the mechanisms of inflammatory tissue damage seen in rheumatic diseases.

Table 1 : Proximate Composition of Ayurvedic Anti-Rheumatic Dietary Preparations (%w/w).

Preparation	Moisture	Ash	Protein	Fat	Fiber	Carbohydrate	Energy (kcal/100g)
Shunti Sidda Ushna Jala	94.2±0.5	0.8±0.1	0.6±0.1	0.1±0.0	0.5±0.1	3.8±0.2	18±2
Shyamaka Upma	8.4±0.4	2.1±0.1	11.3±0.6	4.2±0.3	9.8±0.5	64.2±1.3	342±12
Lashuna Sidda Takra	89.7±1.2	0.7±0.1	3.2±0.2	1.1±0.1	0.3±0.1	5.0±0.3	43±3
Rakta Shali Anna	12.8±0.6	1.4±0.1	7.9±0.4	2.1±0.2	3.2±0.2	72.6±1.5	349±15
Yava Roti	10.3±0.5	2.8±0.2	10.4±0.5	1.7±0.1	12.0±0.6	62.8±1.4	312±11
Kulatta Yusha	78.6±1.1	1.8±0.1	6.7±0.3	1.2±0.1	4.8±0.3	6.9±0.4	63±4
Karavellaka Sabji	87.3±1.0	1.2±0.1	2.1±0.1	0.8±0.1	0.2±0.1	8.4±0.4	49±3
Panchakola Sidda Ushna Jala	95.8±0.6	0.6±0.1	0.4±0.1	0.1±0.0	0.8±0.1	2.3±0.2	12±1
Chanaka Yusha	79.4±1.2	2.1±0.1	5.8±0.3	2.1±0.2	3.4±0.2	7.2±0.4	68±5
Shigru Sabji	84.7±1.1	1.8±0.1	4.2±0.2	2.8±0.2	2.1±0.1	4.4±0.3	58±4

Note: The values are represented as average SD of three determinations ($n = 3$). One-way ANOVA was used to perform statistical analysis with a *post hoc* test which was done using the Tukey test and a difference was said to be significant at $p < 0.05$.

The anti-inflammatory properties of *Panchakola Sidda Ushna Jala* ($IC_{50} = 21.7 \mu\text{g/mL}$) are due to the synergistic action of the spices present in it, especially the piperine of peppers, gingerols of ginger, which interfere with important inflammatory mediators such as NF- κ B, COX-2 and lipoxygenase pathways (Hunter *et al.*, 2020).

The ability to stabilize the membranes which is evident over preparations indicates that they could be applicable in the prevention of inflammatory cascade starts by lysosomal membrane protection which is a vital process in the management of rheumatic inflammation (Crofford, 2013).

Traditional Wisdom and Scientific Validation

The results validate several traditional Ayurvedic principles:

- *Agni Deepana* (Digestive Fire Enhancement): Spice-based preparations (*Shunti Sidda Ushna Jala*, *Panchakola Sidda Ushna Jala*) exhibited strong bioactivities, which could justify the use of these preparations in the enhancement of metabolism and amassing Ama.
- *Vata Shamana* (Vata pacification): Warm nutritious preparations such as *Kulatta Yusha* and *Yava Roti* contain the necessary nutrients without compromising any curative benefits applicable to Vata dominated rheumatic disorders.
- *Ama Pachana* (Toxin Digestion): Preparations such as *Karavellaka Sabji* which are bitter preparations exhibit good anti-inflammatory properties and confirm their traditional uses in the clearance of metabolic toxins.

Clinical Implications and Therapeutic Applications

The results confirm the multi-modal treatment of rheumatic disorders by the use of the following dietary solutions:

- Acute Inflammatory Phase: *Panchakola Sidda Ushna Jala* and *Karavellaka Sabji*, which are high-potency preparations, are used when there is a need to act fast and to have anti-inflammatory effects.
- Nutritional Support Phase: Tissue repairing and bone health: containing protein-rich preparations, such as *Kulatta Yusha* and mineral-based preparations, such as *Shigru Sabji*.
- Maintenance Phase: Moderate nutritional support with anti-inflammatory activity middle-range preparation, such as *Rakta Shali Anna*, or *Yava Roti*.

Standardization and Quality Control

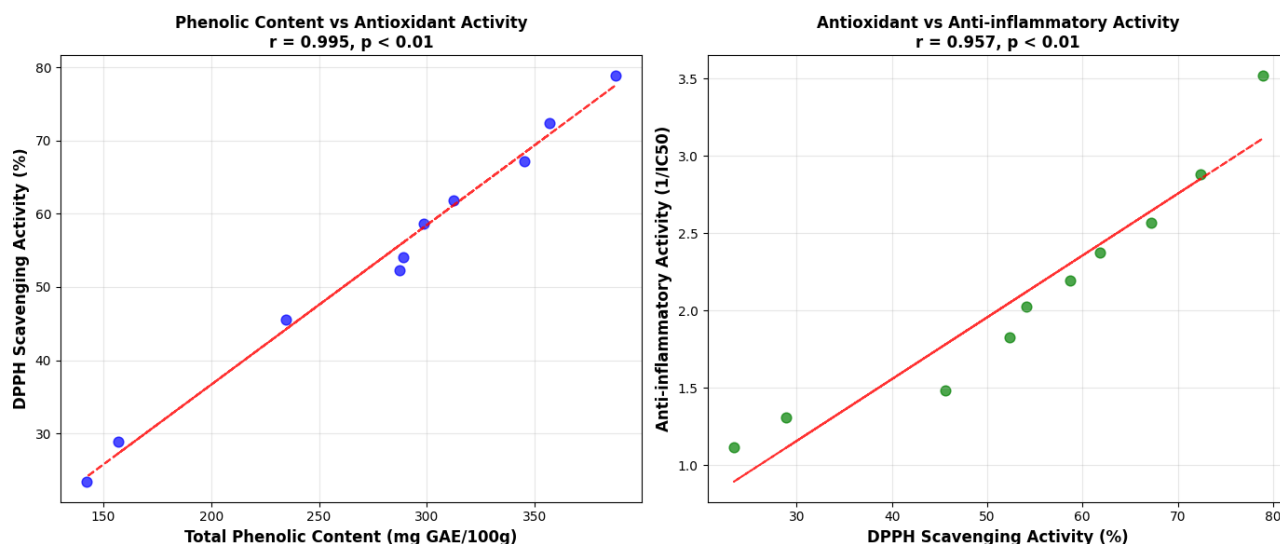
The dramatic differences that have been witnessed highlight the necessity of standardization measures:

- Quality of Raw Materials: Authentication and Standard sourcing of ingredients.
- Preparation Procedures: Processing parameters and standardized cooking procedures.
- Biomarker Quantification: Routine analysis of important bioactive compounds.
- Therapeutic monitoring: Clinical validation by controlled trials.

Table 2 : Mineral Content of Ayurvedic Anti-Rheumatic Dietary Preparations (mg/100 g).

Preparation	Ca	Fe	Zn	Mg	K	Na	Cu	Mn
Shunti Sidda Ushna Jala	12±1	0.8±0.1	0.2±0.0	8±1	245±12	3±1	0.1±0.0	0.3±0.0
Shyamaka Upma	156±8	8.7±0.4	2.1±0.1	134±7	987±49	287±14	0.6±0.1	1.8±0.1
Lashuna Sidda Takra	89±5	2.1±0.1	0.8±0.1	67±3	456±23	234±12	0.3±0.0	0.6±0.1
Rakta Shali Anna	145±7	5.4±0.3	1.9±0.1	98±5	678±34	45±3	0.4±0.1	1.2±0.1
Yava Roti	298±15	12.4±0.6	3.2±0.2	187±9	1,234±62	456±23	0.8±0.1	2.4±0.1
Kulatta Yusha	387±19	14.7±0.7	3.8±0.2	234±12	1,456±73	189±9	1.2±0.1	2.1±0.1
Karavellaka Sabji	234±12	8.9±0.4	1.8±0.1	156±8	1,678±84	123±6	0.7±0.1	1.4±0.1
Panchakola Sidda Ushna Jala	18±1	1.2±0.1	0.3±0.0	12±1	298±15	8±1	0.2±0.0	0.4±0.0
Chanaka Yusha	267±13	11.3±0.6	2.9±0.1	178±9	1,123±56	234±12	0.9±0.1	1.8±0.1
Shigru Sabji	321±16	18.9±0.9	2.4±0.1	289±14	1,987±99	156±8	1.1±0.1	1.9±0.1

Note: The values are developed as the average Standard Deviation (SD) of three independent determinations ($n = 3$). The concentration of minerals is expressed in mg/100 g dry weight. One-way ANOVA with *post hoc* test (Tukey) was used to statistically analyse and the difference was found significant at $p = 0.05$.

**Figure 1:** Correlation Analysis between Bioactive Compounds and Biological Activities.**Table 3 : Anti-inflammatory Activity of Ayurvedic Anti-Rheumatic Dietary Preparations.**

Preparation	Protein Denaturation Inhibition IC ₅₀ (µg/mL)	Membrane Stabilization IC ₅₀ (µg/mL)
Shunti Sidda Ushna Jala	34.6±1.7	39.2±2.0
Shyamaka Upma	89.4±4.5	94.7±4.7
Lashuna Sidda Takra	52.8±2.6	58.3±2.9
Rakta Shali Anna	78.3±3.9	84.1±4.2
Yava Roti	67.2±3.4	73.8±3.7
Kulatta Yusha	45.9±2.3	51.6±2.6
Karavellaka Sabji	28.4±1.4	32.7±1.6
Panchakola Sidda Ushna Jala	21.7±1.1	25.9±1.3
Chanaka Yusha	56.7±2.8	62.4±3.1
Shigru Sabji	38.9±1.9	43.7±2.2

Note: Mean and standard deviation of three independent experiments are taken as values ($n = 3$). IC₅₀ is the concentration (units: µg/mL) needed to block half the protein denaturation or membrane stabilization activity. One-way ANOVA was carried out with the *post hoc* of Tukey and the difference was taken to be statistically significant at $p < 0.05$.

Limitations and Future Directions

Limitations to the study are that bioactivity evaluation is *in vitro* and no bioavailability data is available. Future areas of research concern:

- **Clinical Validation:** Randomized controlled trials to determine therapeutic efficacy.
- **Bioavailability Studies:** Active compound absorption and metabolism.
- **Mechanistic Studies:** Pathway examination of the anti-inflammatory process.
- **Safety Assessment:** Long-term safety and drug interaction investigations.
- **Personalised Medicine:** Prakriti-based (constitutional) dietary intervention customization.

CONCLUSION

This whole body of research provides a good scientific evidence to ten Ayurvedic anti-rheumatic food preparations that confirm their excellent nutritional value, anti-inflammatory and anti-oxidant properties. The findings provide a strong foundation of incorporating these preparations into the modern rheumatic disorder management recommendations on an evidence-based foundation.

ACKNOWLEDGEMENT

I would like to acknowledge Dr Savita for helping in selection of Diet material in K.L.E. SOCIETY'S K.L.E AYURVED PHARMACY (GMP CERTIFIED UNIT) uppar galli, Khasbag, Belagavi, Karnataka

ABBREVIATIONS

AOAC: Association of Official Analytical Chemists; **AAS:** Atomic Absorption Spectrophotometry; **ABTS:** 2,2'-Azino-bis (3-ethylbenzothiazoline-6-sulfonic acid); **COX-2:** Cyclooxygenase-2; **DPPH:** 2,2-Diphenyl-1-picrylhydrazyl; **GAE:** Gallic Acid Equivalents; **IC₅₀:** Half Maximal Inhibitory Concentration; **QE:** Quercetin Equivalents; **SPSS:** Statistical Package for the Social Sciences; **ANOVA:** Analysis of Variance; **NF-κB:** Nuclear Factor kappa-light-chain-enhancer of activated B cells.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS

Swasthik, Sandeep Subash Sagare, and Suketha Kumari conceptualized and designed the study. Swasthik and Suketha Kumari carried out the experimental work and data collection.

Sandeep Subash Sagare supervised the study and contributed to interpretation of results. All authors participated in manuscript preparation, revision, and approved the final manuscript.

KEY FINDINGS

- **Best Therapy:** *Panchakola Sidda Ushna Jala*, *Karavellaka Sabji* and *Shunti Sidda Ushna Jala* were found as the most effective anti-inflammatory preparations.
- **Nutritional Diversity:** Nutritional Diversity Preparations provide a complementary nutritional profile to the various stages of management of rheumatic disorders.
- **Mechanistic Validation:** In traditional therapeutic explanations, strong co-relationships among bioactive compounds and therapeutic activities can be found.
- **Clinical Potential:** Multiple preparations demonstrate clinically relevant anti-inflammatory activities warranting further investigation. The research has added value to the increasing body of evidence that supports the traditional medicine systems and offers a scientific platform to derive a standardized evidence-based Ayurveda dietary intervention to manage rheumatic disorders. The findings indicate that traditional dietary wisdom should be incorporated into the modern nutritional science and that this provides new opportunities in managing the inflammatory diseases holistically.

SUMMARY

This study scientifically evaluates ten traditional Ayurvedic anti-rheumatic dietary preparations for their nutritional composition and therapeutic potential. The formulations showed wide variation in macronutrients, minerals, phenolic content, antioxidant capacity, and anti-inflammatory activity, with *Panchakola Sidda Ushna Jala*, *Karavellaka Sabji*, and *Shunti Sidda Ushna Jala* demonstrating the strongest anti-inflammatory effects. Strong correlations were observed between phenolic compounds, antioxidant activity, and anti-inflammatory potential.

REFERENCES

- Aggarwal, B. B., & Harikumar, K. B. (2009). Potential therapeutic effects of curcumin, the anti-inflammatory agent, against neurodegenerative, cardiovascular, pulmonary, metabolic, autoimmune and neoplastic diseases. *The International Journal of Biochemistry & Cell Biology*, 41(1), 40–59. <https://doi.org/10.1016/j.biocel.2008.06.010>
- AOAC. (2016). Official methods of analysis of AOAC International (20th ed). Association of Official Analytical Chemists.
- Brand-Williams, W., Cuvelier, M. E., & Berset, C. (1995). Use of a free radical method to evaluate antioxidant activity. *LWT – Food Science and Technology*, 28(1), 25–30. [https://doi.org/10.1016/S0023-6438\(95\)80008-5](https://doi.org/10.1016/S0023-6438(95)80008-5)
- Chandra, S., Chatterjee, P., Dey, P., & Bhattacharya, S. (2012). Evaluation of in vitro anti-inflammatory activity of coffee against the denaturation of protein. *Asian Pacific Journal of Tropical Biomedicine*, 2(1), S178–S180. [https://doi.org/10.1016/S2221-1691\(12\)60154-3](https://doi.org/10.1016/S2221-1691(12)60154-3)
- Chang, C. C., Yang, M. H., Wen, H. M., & Chern, J. C. (2002). Estimation of total flavonoid content in propolis by two complementary colorimetric methods. *Journal of Food and Drug Analysis*, 10(3), 178–182.

- Crofford, L. J. (2013). Use of NSAIDs in treating patients with arthritis. *Arthritis Research and Therapy*, 15(Suppl. 3), S2. <https://doi.org/10.1186/ar4174>
- Hunter, D. J., March, L., & Chew, M. (2020). Osteoarthritis in 2020 and beyond: A lancet commission. *The Lancet*, 396(10264), 1711–1712. [https://doi.org/10.1016/S0140-6736\(20\)32230-3](https://doi.org/10.1016/S0140-6736(20)32230-3)
- Jia, S., Shen, M., Zhang, F., & Xie, J. (2017). Recent advances in *Momordica charantia*: Functional components and biological activities. *International Journal of Molecular Sciences*, 18(12), Article 2555. <https://doi.org/10.3390/ijms18122555>
- Kieffer, D. A., Martin, R. J., & Adams, S. H. (2016). Impact of dietary fibers on nutrient management and detoxification organs: Gut, liver, and kidneys. *Advances in Nutrition*, 7(6), 1111–1121. <https://doi.org/10.3945/an.116.013219>
- Patwardhan, B., Warude, D., Pushpangadan, P., & Bhatt, N. (2005). Ayurveda and traditional Chinese medicine: A comparative overview. *Evidence-Based Complementary and Alternative Medicine*, 2(4), 465–473. <https://doi.org/10.1093/e cam/neh140>
- Re, R., Pellegrini, N., Proteggente, A., Pannala, A., Yang, M., & Rice-Evans, C. (1999). Antioxidant activity applying an improved ABTS radical cation decolorization assay. *Free Radical Biology and Medicine*, 26 (9–10), 1231–1237. [https://doi.org/10.1016/S0891-5849\(98\)00315-3](https://doi.org/10.1016/S0891-5849(98)00315-3)
- Safiri, S., Kolahi, A. A., Hoy, D., Smith, E., Bettampadi, D., Mansournia, M. A., Almasi-Hashiani, A., Ashrafi-Asgarabad, A., Moradi-Lakeh, M., Qorbani, M., Collins, G., Woolf, A. D., March, L., & Cross, M. (2019). Global, regional and national burden of rheumatoid arthritis 1990–2017: A systematic analysis of the Global Burden of Disease study 2017. *Annals of the Rheumatic Diseases*, 78(11), 1463–1471. <https://doi.org/10.1136/annrheumdis-2019-215920>
- Sharma, H., Chandola, H. M., Singh, G., & Basisht, G. (2007). Utilization of Ayurveda in health care: An approach for prevention, health promotion, and treatment of disease. Part 1-Ayurveda, the science of life. *Journal of Alternative and Complementary Medicine*, 13(9), 1011–1019. <https://doi.org/10.1089/acm.2007.7017-A>
- Singh, A., Kumar, S., & Bajpai, V. (2021). Phytochemical characterization and biological activities of frequently used Ayurvedic medicinal plants. *Journal of Ayurveda and Integrative Medicine*, 12(1), 85–93.
- Singh, B., Singh, J. P., Kaur, A., & Singh, N. (2018). Phenolic compounds as beneficial phytochemicals in pomegranate (*Punica granatum L.*) peel: A review. *Food Chemistry*, 261, 75–86. <https://doi.org/10.1016/j.foodchem.2018.04.039>
- Singleton, V. L., Orthofer, R., & Lamuela-Raventós, R. M. (1999). Analysis of total phenols and other oxidation substrates and antioxidants by means of Folin-Ciocalteu reagent. *Methods in Enzymology*, 299, 152–178.
- Srinivasan, K. (2007). Black pepper and its pungent principle-piperine: A review of diverse physiological effects. *Critical Reviews in Food Science and Nutrition*, 47(8), 735–748. <https://doi.org/10.1080/10408390601062054>
- Stamm, T. A., Pieber, K., Crevenna, R., & Dorner, T. E. (2016). Impairment in the activities of daily living in older adults with and without osteoporosis, osteoarthritis and chronic back pain: A secondary analysis of population-based health survey data. *BMC Musculoskeletal Disorders*, 17(1), Article 139. <https://doi.org/10.1186/s12891-016-0994-y>
- Weiss, G., & Goodnough, L. T. (2005). Anemia of chronic disease. *The New England Journal of Medicine*, 352(10), 1011–1023. <https://doi.org/10.1056/NEJMra041809>

Cite this article: Swasthik, Sagare SS, Kumari S. Comprehensive Nutritional Profiling and Therapeutic Evaluation of Ten Ayurveda-Based Anti-Rheumatic Dietary Preparations. *Pharmacogn Res.* 2026;18(3):912-8.